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- AB - J09187249 Production of an emulsion containing functional material comprises emulsifying a mixture of functional substance, trehalose agent and water. Also claimed is the production of a powder containing functional substance by drying the emulsion.
- Trehalose and emulsifying agents are used in this preparation at 0.1-100 pts.wt. (preferably 1-50 pts.wt.) and 0.01-50 pts.wt. (preferably 0.1-10 pts.wt.) based on 1 pts.wt. functional material, respectively.
 - USE - This preparation is used in various foods and drinks.
 - ADVANTAGE - This preparation is stable on long-term storage and exerts no influence on the aroma, flavour, colour tone and taste of foods and drinks.
 - In an example, gum arabic (200 g) and trehalose (200 g) were dissolved in water (500 g), heated at 85-90 degrees C for 15 min. and then cooled to 40 degrees C. A mixture of docosahexaenoic acid (DHA) (10 g), middle chain fatty acid triglyceride (30 g) and SAIB (sucrose.diacetate.hexaisobutyrate)(60 g) was added to the solution and the mixture was emulsified by TK-homomixer and further emulsified by high pressure homogeniser (300 kg/cm²) to give 950 g of DHA-containing emulsion.
 - (Dwg.0/0)

IW - PRODUCE EMULSION POWDER CONTAIN FUNCTION MATERIAL MADE EMULSION MIXTURE FUNCTION SUBSTANCE TREHALOSE EMULSION AGENT WATER

IKW - PRODUCE EMULSION POWDER CONTAIN FUNCTION MATERIAL MADE EMULSION MIXTURE FUNCTION SUBSTANCE TREHALOSE EMULSION AGENT WATER

NC - 001

OPD - 1996-01-12

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PAW - (HASE) HASEGAWA CO LTD

TI - Production of emulsion or powder containing functional material - made by emulsifying mixture of functional substance, trehalose, emulsifying agent and water

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(57) 【要約】

【課題】 機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これら飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化又は粉末機能性物質の製造方法を提供する。

【解決手段】 機能性物質、トレハロース、乳化剤及び水を含む混合物を乳化および乾燥することにより、乳化又は粉末機能性物質を得る。

【特許請求の範囲】

【請求項1】 機能性物質、トレハロース、乳化剤及び水を含む混合物を乳化することを特徴とする乳化機能性物質の製造方法。

【請求項2】 請求項1記載の乳化機能性物質を乾燥することを特徴とする粉末機能性物質の製造方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これら飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化機能性物質及び粉末機能性物質の製造方法に関し、さらに詳しくは、機能性物質、トレハロース、乳化剤及び水を含む混合物を乳化することを特徴とする、乳化機能性物質の製造方法及び該乳化機能性物質を乾燥することを特徴とする粉末機能性物質の製造方法に関する。

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(57) [Abstract]

[Problem] It is superior in storage stability of functional substance, it is possible to utilize in the various food and beverage, it is a long term stability fragrance of these food and beverage, without giving what adverse effect to aroma, color tone and tastiness etc, manufacturing method of emulsification or powder functional substance which can reveal the functionality in fully is offered.

[Means of Solution] Emulsification or powder functional substance is obtained by emulsifying and dries the mixture which includes functional substance, trehalose, emulsifier and water and.

[Claim(s)]

[Claim 1] Manufacturing method of emulsifier capability substance which designates that blend which includes the functional substance, trehalose, emulsifier and water is emulsified as feature.

[Claim 2] Manufacturing method of powder functional substance which designates that emulsifier capability substance which is stated in Claim 1 is dried as feature.

[Description of the Invention]

[0001]

[Technological Field of Invention] As for this invention, In storage stability of functional substance to be superior, Thing which is utilized in various food and beverage to do, fragrance of these food and beverage, aroma, color, Being a long term stability, without giving what adverse effect to tastiness etc to be, It regards manufacturing method of emulsifier capability substance and powder functional substance which can reveal the functionality in fully, it regards manufacturing method of powder functional substance where furthermore details designate that blend which includes functional substance, the trehalose,

【0002】

【従来の技術】従来、飲料、その他の食品に、例えば、脳機能改善作用やコレステロール低下作用などの生理活性作用を付与した健康食品を提供する目的で、機能性物質を植物性天然ガム質溶液であるアラビアガム溶液、あるいは化工でん粉、デキストリンのごとき乳化剤、賦形剤などを用いて乳化して乳状液としたり、又は、その乳状液を噴霧乾燥して粉末にして使用することが一般的に行われている。また、油性機能性物質をショ糖脂肪酸エステル、グリセリン脂肪酸エステル、ポリグリセリン脂肪酸エステルなどの合成界面活性剤、適当な賦形剤などを用いて乳化し、噴霧乾燥する方法も行われている。

【0003】しかしながら、機能性物質を乳化剤、賦形剤などの存在下に乳化して得られる乳状液、又は、この乳状液を、例えば噴霧乾燥して得られる粉末は、含有される機能性物質の保存安定性が悪く、劣化臭発生の原因ともなり必ずしも満足できるものではない。

【0004】

【発明が解決しようとする課題】本発明の目的は、機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これら飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化又は粉末機能性物質の製造方法を提供するにある。

【0005】

【課題を解決するための手段】本発明者らは上記のごとき欠点を有する従来型の機能性物質含有乳状液又は粉末について、その欠点を解決すべく鋭意研究を行った。その結果、例えば、でん粉を酵素分解して得られる、グルコースが α 、 $\alpha-1$ 、1結合で2個つながった二糖類、すなわちトレハロースを、乳化又は粉末機能性物質の製造の乳化の際に添加することにより、得られた乳化又は粉末機能性物質（以下、機能性製剤と略称することもある）は長期間安定に保存することが可能になり、また、各種飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく安定であり、機能性を十分に発現できるという事実を見だし、本発明を完成するに至った。

emulsifier and water is emulsified as feature, designatethe manufacturing method of emulsifier capability substance and that said emulsifier capability substance is dried as feature.

[0002]

[Prior Art] Until recently, in beverage and other foodstuff, with object which offers health food which grants for example cerebral function improving action and cholesterol decreasing action or other physiological activity, emulsifying the functional substance gum arabic solution or chemical engineering starch which is a vegetable natural gum substance solution, making use of dextrin or other emulsifier and excipient, etc it makes emulsified liquid, or, spray drying does emulsified liquid and using in the powder is done generally. In addition, it emulsifies oily functional substance making use of sucrose fatty acid ester, the glycerin fatty acid ester, polyglycerine fatty acid ester or other synthetic surfactant and suitable excipient etc, also method which spray drying is done is done.

[0003] But, emulsifying functional substance under emulsifier and excipient or other existence, the emulsified liquid which is acquired, or, for example spray drying doing this emulsified liquid, as for powder which is acquired, the storage stability of functional substance which is contained is bad, it is not something where becomes also cause of deterioration odor occurrence and always can be satisfied.

[0004]

[Problems to be Solved by the Invention] Objective of this invention is superior in storage stability of functional substance, it is impossible to utilize in various food and beverage, it is a long term stability the fragrance of these food and beverage, without giving what adverse effect to aroma, the color tone and tastiness etc, it is to offer manufacturing method of emulsification or the powder functional substance which can reveal functionality in fully.

[0005]

[Means to Solve the Problems] These inventors in order that deficiency is solved concerning functional substance content emulsified liquid or powder of conventional which possesses the above-mentioned or other deficiency, did diligent research. As a result, enzymolysis doing for example starch, it is acquired, glucose being, - 1,1 connection, 2 it was connected disaccharides, namely trehalose, In adding to case of emulsification or emulsification of production of powder functional substance to depend, as for emulsification or powder functional substance (Below, functionality formulation there are also times when it

【0006】かくして、本発明によれば、機能性物質、トレハロース及び水を含む混合物を乳化および乾燥することにより、機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これらの飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化機能性物質及び粉末機能性物質の製造方法が提供される。

【0007】以下、本発明について更に詳細に述べる。

【0008】本発明において使用しうる機能性物質は、特に制限されるものでなく、例えば、ドコサヘキサエン酸(DHA)、エイコサペンタエン酸(EPA)、DHA及びEPA含有魚油、リノール酸、 γ -リノレン酸、 α -リノレン酸、月見草油、ボラージ油、レシチン、オクタコサノール、ローズマリー、セージ、 γ -オリザノール、 β -カロテン、パームカロテン、シソ油、キチン、キトサン、ロイヤルゼリー、プロポリス、及び油溶性ビタミン類などを挙げることができる。

【0009】また、本発明で使用するトレハロースは、例えば、ブドウ糖溶液中で酵母を培養して、酵母菌体中にトレハロースをつくらせ、このトレハロースを菌体から分離する方法、ブドウ糖溶液中でバクテリアを培養し培養液中にトレハロースをつくらせ、このトレハロースを培養液から分離する方法などの方法で製造することができるが、市販のトレハロースを利用することもできる。このトレハロースの使用量は、使用する機能性物質の種類及び形態、乳化剤の種類などにより適宜に選択することができるが、一般には、機能性物質1重量部に対して約0.1~約100重量部、好ましくは約1~約50重量部の範囲が適当である。

【0010】さらに、本発明で使用する乳化剤も特に制限されるものではなく、従来から飲食品等に用いられている各種の乳化剤が使用可能であり、例えば、脂肪酸モノグリセリド、脂肪酸ジグリセリド、脂肪酸トリグリセリド、プロピレングリコール脂肪酸エステル、ショ糖脂肪酸エステル、ポリグリセリン脂肪酸エステル、レシチン、化工でん粉、ソルビタン脂肪酸エステル、キラヤ抽出物、アラビアガム、トラガントガム、グアー

abbreviates.) which is acquired it becomes possible to retain in long term stability, in addition, it is a stability fragrance of various food and beverage, without giving the what adverse effect to aroma, color and tastiness etc, you discovered the fact that this invention reached to completion it can reveal functionality in fully.

[0006] In this way doing, In this invention we depend, functional substance, In emulsifying and drying blend which includes trehalose and the water and to depend, It is superior in storage stability of functional substance, it is possible to utilize in the various food and beverage, it is a long term stability fragrance of these food and beverage, without giving what adverse effect to aroma, color and tastiness etc, manufacturing method of emulsifier capability substance and powder functional substance which can reveal functionality in fully is offered.

[0007] Furthermore you express in detail below, concerning this invention.

[0008] Regarding to this invention, it can use as for functional substance which, Especially, not to be something which is restricted, for example docosahexaenoic acid (DHA), the eicosapentaenoic acid (EPA), DHA and EPA content fish oil, linolic acid, - linolinic acid, the - linolinic acid, evening primrose oil and bora - di oil, lecithin, octaconasol, the rosemary, sage, - oryzanol, - carotene, palm carotene, perilla oil, the chitin, chitosan, Royal jelly, propolis and and oil-soluble vitamin etc can be listed.

[0009] In addition, method trehalose which is used with this invention, culturing yeast in for example fructose solution, making trehalose make in yeast, separating this trehalose from cell mass. It can culture bacteria in fructose solution and to make trehalose culture medium make, it can produce with method or other method which separates this trehalose from the culture fluid, but it is possible also to utilize commercial trehalose. It can select amount used of this trehalose, appropriately due to types and form of functional substance which is used and types etc of the emulsifier, but generally, approximately 0.1 to approximately 100 parts by weight, the inside of range of preferably approximately 1 to approximately 50 parts by weight is suitable vis-a-vis functional substance 1 part by weight.

[0010] Furthermore, It to be something where also emulsifier which is used with this invention especially is restricted, Various emulsifier which from until recently are used for the food and beverage etc are usable, for example aliphatic acid monoglyceride, aliphatic acid diglyceride, aliphatic acid triglyceride, propylene glycol aliphatic ester, the sucrose aliphatic ester,

ガム、カラヤガム、キサンタンガム、ペクチン、アルギン酸及びその塩類、カラギーナン、ゼラチン、カゼイン等を挙げることができる。

【0011】これら乳化剤の使用量は厳密に制限されるものではなく、用いる乳化剤の種類等に応じて広い範囲にわたり変えることができるが、通常、機能性物質1重量部に対し約0.01～約50重量部、好ましくは約0.1～約10重量部の範囲内が適当である。

【0012】本発明によれば、機能性物質、トレハロース及び水を乳化剤の存在下に乳化することにより、乳化機能性物質を容易に製造することができる。また、乳化機能性物質を、適当な乾燥手段により乾燥することにより、容易に粉末機能性物質を製造することができる。上記の乳化に際して、必要に応じて、デキストリン、砂糖、乳糖、ブドウ糖、水飴、還元水飴等の糖類を適宜配合することもできる。これらの使用量は機能性製剤に望まれる特性等に応じて適宜に選択することができる。

【0013】

【発明の実施の形態】本発明の機能性製剤の調製法の好ましい一実施態様を示せば、例えば、まず水120重量部に前記した如き乳化剤40重量部とトレハロース40重量部を溶解させ、それに前記した如き機能性物質20重量部を添加し、ホモミキサー、コロイドミル、高圧ホモジナイザー等を用いて乳化処理を行い、乳化製剤を得る。また、この乳化製剤を真空乾燥、噴霧乾燥等の乾燥手段で乾燥することにより、粉末製剤とすることができる。このようにして得られた製剤は、保存安定性に優れた機能性製剤である。

【0014】かくして、上述のようにして得られる機能性製剤は、例えば、飲料、粉末飲料、デザート、チューインガム、錠菓、スナック類、水産加工食品、畜肉加工食品、レトルト食品などの飲食品に利用することができる。これら飲食品に配合される機能性製剤の使用量は、飲食品の種類、形態などにより異なるが、一般的には飲食品1重量部に対して約0.001～約0.1重量部の範囲内で使用することができる。

polyglycerine aliphatic ester, lecithin and chemical engineering starch, the sorbitan aliphatic ester, quillaja extract, gum arabic, tragacanth gum, guar gum, karaya gum, the xanthan gum, pectin, alginic acid and its salt, carageenan, gelatin and casein etc can be listed.

[0011] Amount used of these emulsifier is not something which is restricted strictly, it is possible to change according to types etc of the emulsifier which is used over wide range, but approximately 0.01 to approximately 50 parts by weight, inside of range of preferably approximately 0.1 to approximately 10 parts by weight is suitable usually, vis-a-vis the functional substance 1 part by weight.

[0012] emulsifier capability substance can be produced easily according to this invention, by emulsifying functional substance, trehalose and water under existing of the emulsifier. In addition, powder functional substance can be produced easily by drying emulsifier capability substance, with suitable drying means. At time of above-mentioned emulsification, it is possible also to combine according to need, dextrin, sugar, lactose, fructose, the malt syrup and reduced malt syrup or other saccharides appropriately. It can select these usage appropriately according to characteristic etc which is desired to functionality formulation.

[0013]

[Embodiment of Invention] If embodiment where preparation method of functionality formulation of this invention is desirable is shown, melting emulsifier 40 parts by weight and kind of trehalose 40 parts by weight which for example first before were inscribed to water 120 parts by weight, before, it adds kind of functional substance 20 parts by weight which was inscribed to that, it does emulsification process making use of the homogenizer, colloid mill and high pressure homogenizer, etc obtains emulsified formulation. In addition, it can make powder formulation this emulsified formulation by drying with vacuum drying and spray drying or other drying means. formulation which it acquires in this way is functionality formulation which is superior in storage stability.

[0014] for example beverage, powder beverage, dessert, chewing gum, lozenge, snack, it can utilize functionality formulation which is acquired this way, above-mentioned way, in processed seafood, meat processed food and retort food or other food and beverage. amount used of functionality formulation which is combined in these food and beverage differs depending upon types and form etc of food and beverage, but generally you can use inside range of approximately 0.001 to approximately 0.1 parts by

【0015】次に実施例を挙げて本発明をさらに具体的に説明する。

【0016】

【実施例】

実施例1

水500gにアラビアガム200g及びトレハロース200gを加えて溶解し、85～90℃で15分間加熱殺菌した後、これを40℃に冷却する。別にDHA10g、中鎖脂肪酸トリグリセリド30g、SAIB（シュクロース・ジアセテート・ヘキサイソブチレート）60g混合溶解したものを、先のアラビアガム、トレハロース混合液に添加した後、TK-ホモミキサーで予備乳化した。更に、この液を高圧ホモジナイザーにて300Kg/cm²の圧力で乳化し、DHA含有乳化製剤950g（本発明品1）を得た。

【0017】参考例1

実施例1のトレハロースの代わりにグリセリンを同量使用した他は、実施例1と同様の操作を行いDHA含有乳化液950g（参考品1）を得た。

【0018】実施例2

水400gにグリセリン240g、ポリグリセリンモノオレート20g及びトレハロース300gを加えて溶解し、85～90℃で15分間加熱殺菌し、60℃に冷却した。この溶液をTK-ホモミキサーで攪拌しながらオクタコサノール40gを中鎖飽和脂肪酸トリグリセリド60gに溶解した液を添加混合して予備乳化し、更に高圧ホモジナイザーにて200Kg/cm²の圧力で乳化し、オクタコサノール含有乳化製剤1000g（本発明品2）を得た。

【0019】参考例2

実施例2のトレハロースの代わりにD-ソルビトールを同量使用した他は、実施例2と同様の操作を行いオクタコサノール含有乳化製剤1000g（参考品2）を得た。

【0020】比較例1

実施例1、2及び参考例1、2で得られた乳化機能性物質を用いて、下記に示す処方に従って飲料を調製した。

weightvis-a-vis food and beverage 1 part by weight.

[0015] Listing Working Example next, furthermore you explain this invention concretely.

[0016]

[Working Example(s)]

Working Example 1

It melts in water 500g including gum arabic 200g and trehalose 200g, with the 85 to 90 °C 15 min heat sterilization after doing, it cools this in 40 °C. Separately DHA 10g, those which medium chain fatty acid triglyceride 30g, SAIB(sucrose * diacetate * hexa isobutanoate)60g it mixes melts, the gum arabic ahead, after adding to trehalose mixed solution, preparatory emulsification were done with the TK - homogenizer. Furthermore, this liquid with high pressure homogenizer was emulsified with pressure of 300 kg/cm², DHA-containing emulsified formulation 950g(article of this invention 1) was acquired.

[0017] Reference Example 1

Besides same amount you use glycerin, operation of being similar to the Working Example 1 was done in place of trehalose of Working Example 1 and DHA-containing emulsion 950g (Reference item 1) was acquired.

[0018] Working Example 2

It melted in water 400g including glycerin 240g, poly glycerine mono oleate 20g and the trehalose 300g, 15 min heat sterilization did with 85 to 90 °C, cooled in 60 °C. While agitating this solution with TK - homogenizer, adding and mixing doing liquid which melts octacosanol 40g in medium chain saturated aliphatic acid triglyceride 60g, preparatory emulsification it did, furthermore with the high pressure homogenizer emulsified with pressure of 200 kg/cm², acquired octacosanol content emulsified formulation 1000g(article of this invention 2).

[0019] Reference Example 2

Besides same amount you use D - sorbitol, operation of being similar to the Working Example 2 was done in place of trehalose of Working Example 2 and octacosanol content emulsified formulation 1000g (Reference item 2) was acquired.

[0020] Comparative Example 1

Following to formulation which is shown on description below, making use of emulsifier capability substance which is acquired with Working Example 1, 2 and

【0021】

	処方例		
	No 1	No 2	No 3
No 4			
グラニュー糖 100.0g	100.0g	100.0g	100.0g
クエン酸 0.2	0.2	0.2	0.2
水 900.0	900.0	900.0	900.0
本発明品 1	0.1	—	—
本発明品 2	—	0.1	—
参考品 1	—	—	0.1
参考品 2 0.1	—	—	—
合計 1000.3	1000.3	1000.3	1000.3

【0022】 上述の処方で調製した飲料を250ccのジュース瓶にホットパックし、冷却後、37℃にて3ヶ月間保存した。保存後、この飲料を専門パネラー10名にて、香気香味の官能評価を行った。その結果、専門パネラーの全員が、本発明品1及び2を配合したNo1及びNo2は、ともに保存による劣化臭は認められず良好な香気香味を保持していると判定した。一方、参考品1及び2を配合したNo3及びNo4は、ともに保存による著しい劣化臭が認めらるゝと判定した。このことから、トレハロースは、機能性物質の保存安定性に優れた効果を有し、極めて有用であることがわかる。

【0023】 実施例3

水100gに化工でん粉20g、デキストリン50g及びトレハロース20gを加えて溶解し、85～90℃で15分間加熱殺菌する。これを40℃に冷却し、DHA含有精製魚油10gを添加混合した後、TKーホモミキサーで乳化した。この液をニロ社のモービルマイナー型スプレードライヤーを使用して、入口温度140℃、出口温度75℃にて噴霧乾燥し、DHA含有精製魚油粉末製剤95g（本発明品3）を得た。

Reference Example 1, 2, itmanufactured beverage.

[0021]

	Formulation example			
	No1	No2	No3	No4
Granular sugar 100.0g	100.0g	100.0g	100.0g	100.0g
Citric acid	0.2	0.2	0.2	0.2
Water 900.0	900.0	900.0	900.0	900.0
Article of this invention 1	0.1	—	—	—
Article of this invention 2	—	0.1	—	—
Reference item 1	—	—	0.1	—
Reference item 2	—	—	—	0.1
Total	1000.31	1000.31	1000.31	1000.31

[0022] Hot pack it did beverage which is manufactured with theabove-mentioned formulation in juice bottle of 250 cc, after cooling, the3 months retained with 37 °C . After retaining, this beverage with expert panel member 10 persons , sensory evaluation of fragrance and flavor wasdone. As a result, as for No1 or No2 which combine article of this invention 1 and 2, asfor deterioration odor together due to retention it could notrecognize all members of expert panel member and, it decided that satisfactoryfragrance and flavor is kept. On one hand, considerable deterioration odor where No3 andthe No4 which combine reference item 1 and 2 are due to retentiontogether decided signet and others with. From this, trehalose has effect which is superior in thestorage stability of functional substance, it understands that quite it is useful.

[0023] Working Example 3

It melts in water 100g chemical engineering starch 20g, includingthe dextrin 50g and trehalose 20g, 15 min heat sterilization does with 85 to 90 °C. This was cooled in 40 °C, adding and mixing after doing DHA-containing purified fish oil 10g, wasemulsified with TK - homogenizer. Using Mobile minor type spray dryer of Niro corporation, spray drying it didthis liquid with inlet temperature 140 °C , and outlet

【0024】参考例3

実施例3のトレハロースの代わりにデキストリン (DE10) を同量使用した他は、実施例3と同様に行いDHA含有精製魚油粉末95g (参考品3) を得た。

【0025】実施例4

水100gにHLB15のショ糖脂肪酸エステル5g、DE10のデキストリン45g及びトレハロース30gを加えて溶解し、85~90℃で15分間加熱殺菌した。この溶液を約40℃に冷却後、TK-ホモミキサーで攪拌しながらγ-リノレン酸20gを添加混合して乳化液を得た。この液を実施例3と同様に噴霧乾燥してγ-リノレン酸含有粉末製剤95g (本発明品4) を得た。

【0026】参考例4

実施例4のトレハロースの代わりに砂糖を同量使用した他は、実施例4と同様の操作を行いγ-リノレン酸含有粉末95g (参考品4) を得た。

【0027】比較例2

実施例3、4及び参考例3、4で得られた機能性物質含有製剤及び粉末を用いて、下記に示す処方に従って粉末飲料を調製した。粉末飲料50gをそれぞれポリ袋に入れ、37℃にて3ヶ月間保存した。

【0028】

	処方例		
	No 5	No 6	No 7
No 8			
グラニュー糖 42.4g	42.4g	42.4g	42.4g
グルコース 24.0	24.0	24.0	24.0
クエン酸 2.0	2.0	2.0	2.0
ビタミンC 0.5	0.5	0.5	0.5

temperature 75 °C acquired DHA-containing purified fish oil powder formulation 95g(article of this invention 3).

[0024] Reference Example 3

It did besides same amount you use dextrin (DE10), in same way as the Working Example 3 in place of trehalose of Working Example 3 and acquired DHA-containing purified fish oil powder 95g (Reference item 3).

[0025] Working Example 4

It melted in water 100g sucrose fatty acid ester 5g of HLB15, including the dextrin 45g and trehalose 30g of DE10, 15 min heat sterilization did with 85 to 90 °C. While in approximately 40 °C after cooling, agitating this solution with the TK - homogenizer, adding and mixing doing - linolenic acid 20g, it acquired emulsion. spray drying doing this liquid in same way as Working Example 3, it acquired the - linolenic acid content powder formulation 95g(article of this invention 4).

[0026] Reference Example 4

Besides same amount you use sugar, operation of being similar to the Working Example 4 was done in place of trehalose of Working Example 4 and - linolenic acid content powder 95g (Reference item 4) was acquired.

[0027] Comparative Example 2

Following to formulation which is shown on description below, making use of functional substance content formulation and powder which are acquired with the Working Example 3, 4 and Reference Example 3, 4, it manufactured powder beverage. You inserted powder beverage 50g in poly bag respectively, 3 months retained with 37 °C.

[0028]

	Formulation example			
	No5	No6	No7	No8
Granular sugar 42.4g	42.4g	42.4g	42.4g	42.4g
Glucose	24.0	24.0	24.0	24.0
Citric acid	2.0	2.0	2.0	2.0
Vitamin C	0.5	0.5	0.5	0.5

クエン酸ナトリウム 1.0	1.0	1.0	1.0	Sodium citrate	1.0	1.0	1.0	1.0
本発明品 3 —	0.1	—	—	Article of this invention 3	0.1	—	—	—
本発明品 4 —	—	0.1	—	Article of this invention 4	—	0.1	—	—
参考品 3 —	—	—	0.1	Reference item 3	—	—	0.1	—
参考品 4 0.1	—	—	—	Reference item 4 0.1	—	—	—	—
合計 70.0	70.0	70.0	70.0	Total 0	70.0	70.0	70.0	70.0

【0029】上述の3ヶ月間保存した粉末飲料7gを水100gで希釈し、専門パネラー10名にて、香気香味の官能評価を行った。その結果、専門パネラーの全員が、本発明品3及び4を配合したNo5及びNo6は、ともに保存による劣化臭は認められず良好な香気香味を保持していると判定した。一方、参考品3及び4を配合したNo7及びNo8は、ともに保存による著しい劣化臭が認めらると判定した。このことから、トレハロースは、機能性物質の保存安定性に優れた効果を発揮し、極めて有用であることがわかる。

【0030】

【発明の効果】本発明によれば、機能性物質の保存安定性に優れ、各種の飲食品に利用することができ、これら飲食品の香気、香味、色調、嗜好性などになんら悪影響を与えることなく長期間安定であり、機能性を十分に発現できる乳化又は粉末機能性物質の製造方法を提供するにある。

[0029] Above-mentioned 3 months powder beverage 7 g which is retained was diluted with the water 100g, with expert panel member 10 persons, sensory evaluation of fragrance and flavor was done. As a result, as for No5 or No6 which combine article of this invention 3 and 4, as for deterioration odor together due to retention it could not recognize all members of expert panel member and, it decided that satisfactory fragrance and flavor is kept. On one hand, considerable deterioration odor where No7 and the No8 which combine reference item 3 and 4 are due to retention together decided signet and or with. From this, trehalose shows effect which is superior in the storage stability of functional substance, it understands that quite it is useful.

[0030]

[Effects of the Invention] According to this invention, it is superior in storage stability of functional substance, it is possible to utilize in various food and beverage, it is a long term stability the fragrance of these food and beverage, without giving what adverse effect to aroma, the color tone and tastiness etc, it is to offer manufacturing method of emulsification or the powder functional substance which can reveal functionality in fully.